



中认信通
CHINA CERTIFICATION ICT CO., LTD (DONGGUAN)

TEST REPORT

Applicant: Lumi United Technology Co., Ltd

Address: Room 801-804, Building 1, Chongwen Park, Nanshan iPark, No. 3370, Liuxian Avenue, Fuguang Community, Taoyuan Residential District, Nanshan District, Shenzhen, China

Product Name: Presence Sensor FP2

Model Number: PS-S02E, PS-S02D

Standard(s): AS/NZS 4268:2017 AMD 1:2021

The above equipment has been tested and found compliant with the requirement of the relative standards by China Certification ICT Co., Ltd (Dongguan)

Report Number: CR230422500-14

Date Of Issue: 2023/4/27

Reviewed By: Sun Zhong

Sun Zhong

Title: Manager

Test Laboratory: China Certification ICT Co., Ltd (Dongguan)
No. 113, Pingkang Road, Dalang Town, Dongguan,
Guangdong, China
Tel: +86-769-82016888

Test Facility

The Test site used by China Certification ICT Co., Ltd (Dongguan) to collect test data is located on the No. 113, Pingkang Road, Dalang Town, Dongguan, Guangdong, China.

Declarations

China Certification ICT Co., Ltd (Dongguan) is not responsible for the authenticity of any test data provided by the applicant. Data included from the applicant that may affect test results are marked with a triangle symbol “▲”. Customer model name, addresses, names, trademarks etc. are not considered data.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.

This report cannot be reproduced except in full, without prior written approval of the Company.

This report is valid only with a valid digital signature. The digital signature may be available only under the Adobe software above version 7.0.

This report may contain data that are not covered by the accreditation scope and shall be marked with an asterisk “★”.

CONTENTS

TEST FACILITY	2
DECLARATIONS.....	2
DOCUMENT REVISION HISTORY	4
1. GENERAL INFORMATION	5
1.1 PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)	5
1.2 TEST METHODOLOGY	6
2. SUMMARY OF TEST RESULTS	8
ATTACHMENT	9

DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
1.0	CR230422500-14	Original Report	2023/4/27

1. GENERAL INFORMATION

1.1 Product Description for Equipment under Test (EUT)

EUT Name:	Presence Sensor FP2
EUT Model:	PS-S02E
Multiple Model:	PS-S02D
Rated Input Voltage:	5Vdc from USB
Serial Number:	1SR6-1
EUT Received Date:	2022/12/2
EUT Received Status:	Good

Note: The Multiple models are electrically identical with the test model. Please refer to the declaration letter for more detail, which was provided by manufacturer.

Technical Specification:

Operation Frequency Range (GHz):	60-64GHz
RF Output Power (EIRP) (dBm):	11.75
Number of Chains	Transmit: 3
	Receive: 4
Antenna Gain (dBi)^A:	5
Modulation Type:	FMCW

Accessory Information:

Accessory Description	Manufacturer	Model	Parameters
USB Cable	Unknown	Unknown	Unshielded, 2m

1.2 Test Methodology

All measurements contained in this report were conducted with AS/NZS 4268:2017.

According to AS/NZS 4268:2017§6.1:

6.1 General

Evidence of transmitter compliance to this Standard may be demonstrated by providing a complete ETSI or FCC test report. Australian and New Zealand requirements, for example, frequency assignments or transmitter power levels, may be different to international requirements and compliance with any differences shall be addressed and documented.

To determine compliance, a transmitter has the option of being tested to either the ETSI or FCC generic standards listed in Clause 6.2.2. Where Table 1 (in the column headed ‘Test method’) lists a specific ETSI product Standard for Australia, the supplier still has the option of testing to the FCC generic standard and vice versa. Refer to Figure 1 for guidance.

Where testing to an ETSI Standard or the FCC rules is permitted by this Standard (AS/NZS 4268), testing to the requirements of either of these shall be undertaken to the version(s) of the ETSI Standard published in the *Official Journal of the European Union*, or the FCC rules that apply on the date the device is imported into or manufactured in Australia or New Zealand.

According to AS/NZS 4268:2017 Clause 6.2.2 & table 1 item 71

6.2.2 Generic Standards

The applicable ETSI short range device Standards are as follows:

Equipment and frequency range	Method of measurement
Radio equipment 9 kHz to 25 MHz; and inductive loop systems 9 kHz to 30 MHz	ETSI EN 300 330-1
Radio equipment 25 MHz to 1000 MHz	ETSI EN 300 220-1
Radio equipment 1 GHz to 40 GHz	ETSI EN 300 440-1
Radio equipment 40 GHz to 246 GHz	ETSI EN 305 550-1

Table—Transmitters

<i>Column 1</i>	<i>Column 2</i>	<i>Column 3</i>	<i>Column 4</i>
Class of transmitter	Permitted operating frequency band (MHz) (lower limit exclusive, upper limit inclusive)	Maximum EIRP	Limitations
22A All transmitters	57000-64000	100mW	<p>(a) The maximum transmitter power must not exceed 10 mW.</p> <p>(b) The maximum radiated power spectral density must not exceed 13dBm per 1 MHz.</p>

So, test method & Maximum EIRP of device meets ETSI EN 305 550-1 V1.2.1 (2014-10) and ETSI EN 305 550-2 V1.2.1 (2014-10)

2. SUMMARY OF TEST RESULTS

S/N	ETSI EN 305 550-2 (2014-10) Rules	Description of Test	Result
1	§4.2.1.1	Spectral power density	Compliant*
2	§4.2.1.2	RF output power	Compliant*
3	§4.2.1.3	Permitted range of operating frequencies	Compliant*
4	§4.2.1.4	Transmitter emissions in the Out-of-band domain	Compliant*
5	§4.2.1.5	Transmitter unwanted emissions in the spurious domain	Compliant*
6	§4.2.2	Receiver spurious components	Not Applicable

Note:

Compliant*: The test data please refer to the Original Report

Not applicable: EUT not support receive-only mode

Maximum EIRP is 11.75dBm, Antenna Gain is 5 dBi,
so maximum transmitter power is 6.75dBm(4.73mW)<10mW, compliant.

ATTACHMENT



TEST REPORT

Applicant: Lumi United Technology Co., Ltd

Address: Room 801-804, Building 1, Chongwen Park, Nanshan iPark, No. 3370, Liuxian Avenue, Fuguang Community, Taoyuan Residential District, Nanshan District, Shenzhen, China

Product Name: Presence Sensor FP2

Model Number: PS-S02E, PS-S02D

Standard(s): ETSI EN 305 550-1 V1.2.1 (2014-10)
ETSI EN 305 550-2 V1.2.1 (2014-10)

The above equipment has been tested and found compliant with the requirement of the relative standards by China Certification ICT Co., Ltd (Dongguan)

Report Number: CR221157696-22

Date Of Issue: 2022/12/23

Reviewed By: Sun Zhong *Sun Zhong*

Title: Manager

Test Laboratory: China Certification ICT Co., Ltd (Dongguan)
No. 113, Pingkang Road, Dalang Town, Dongguan,
Guangdong, China
Tel: +86-769-82016888

Test Facility

The Test site used by China Certification ICT Co., Ltd (Dongguan) to collect test data is located on the No. 113, Pingkang Road, Dalang Town, Dongguan, Guangdong, China.

Declarations

China Certification ICT Co., Ltd (Dongguan) is not responsible for the authenticity of any test data provided by the applicant. Data included from the applicant that may affect test results are marked with a triangle symbol “▲”. Customer model name, addresses, names, trademarks etc. are not considered data.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.

This report cannot be reproduced except in full, without prior written approval of the Company.

This report is valid only with a valid digital signature. The digital signature may be available only under the Adobe software above version 7.0.

This report may contain data that are not covered by the accreditation scope and shall be marked with an asterisk “★”.

CONTENTS

TEST FACILITY	2
DECLARATIONS.....	2
1. GENERAL INFORMATION	5
1.1 PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)	5
1.2 DESCRIPTION OF TEST CONFIGURATION.....	6
1.2.2 Support Equipment List and Details	6
1.2.3 Support Cable List and Details	6
1.2.4 Block Diagram of Test Setup.....	7
1.3 TEST METHODOLOGY	8
1.4 MEASUREMENT UNCERTAINTY	8
2. SUMMARY OF TEST RESULTS	9
3. REQUIREMENTS AND TEST PROCEDURES	10
3.1 SPECTRAL POWER DENSITY	10
3.1.1 Applicable Standard.....	10
3.1.2Test Procedure	10
3.2 RF OUTPUT POWER.....	11
3.2.1Applicable Standard.....	11
3.2.2 Test Procedure	11
3.3 PERMITTED RANGE OF OPERATING FREQUENCIES	12
3.3.1 Applicable Standard.....	12
3.3.2Test Procedure	12
3.4 OUT-OF-BAND EMISSIONS	13
3.4.1 Applicable Standard.....	13
3.4.2 Test Procedure	14
3.5 UNWANTED EMISSIONS IN THE SPURIOUS DOMAIN	15
3.5.1 Applicable Standard.....	15
3.5.2 Test Procedure	16
3.6 RECEIVER SPURIOUS COMPONENTS.....	17
3.6.1 Applicable Standard.....	17
3.6.2 Test Procedure	17
4. TEST DATA AND RESULTS	18
4.1 SPECTRAL POWER DENSITY	18
4.2 RF OUTPUT POWER.....	19
4.3 PERMITTED RANGE OF OPERATING FREQUENCIES	20
4.4 OUT-OF-BAND EMISSIONS	22
4.5 UNWANTED EMISSIONS IN THE SPURIOUS DOMAIN	23
5. EUT PHOTOGRAPHS	26

6. TEST SETUP PHOTOGRAPHS 38

1. GENERAL INFORMATION

1.1 Product Description for Equipment under Test (EUT)

EUT Name:	Presence Sensor FP2
EUT Model:	PS-S02E
Multiple Model:	PS-S02D
Rated Input Voltage:	5Vdc from USB
Serial Number:	1SR6-1
EUT Received Date:	2022/12/2
EUT Received Status:	Good

Note: The Multiple models are electrically identical with the test model. Please refer to the declaration letter for more detail, which was provided by manufacturer.

Technical Specification:

Operation Frequency Range (GHz):	60-64GHz
RF Output Power (EIRP) (dBm):	11.75
Number of Chains	Transmit: 3
	Receive: 4
Antenna Gain (dBi)^A:	5
Modulation Type:	FMCW

Accessory Information:

Accessory Description	Manufacturer	Model	Parameters
USB Cable	Unknown	Unknown	Unshielded, 2m

1.2 Description of Test Configuration

1.2.1 EUT Operation Condition:

EUT Operation Mode:	The system was configured for testing in Engineering Mode, which was provided by the manufacturer.
Equipment Modifications:	No
EUT Exercise Software:	No

The extreme test conditions which were declared by the manufacturer and the normal conditions are as below:
NT: Normal Temperature +25°C,
LT: Low Temperature -10°C,
HT: High Temperature +40°C
NV: Normal Voltage 5V,
LV: Low Voltage 4.5V,
HV: High Voltage 5.5V

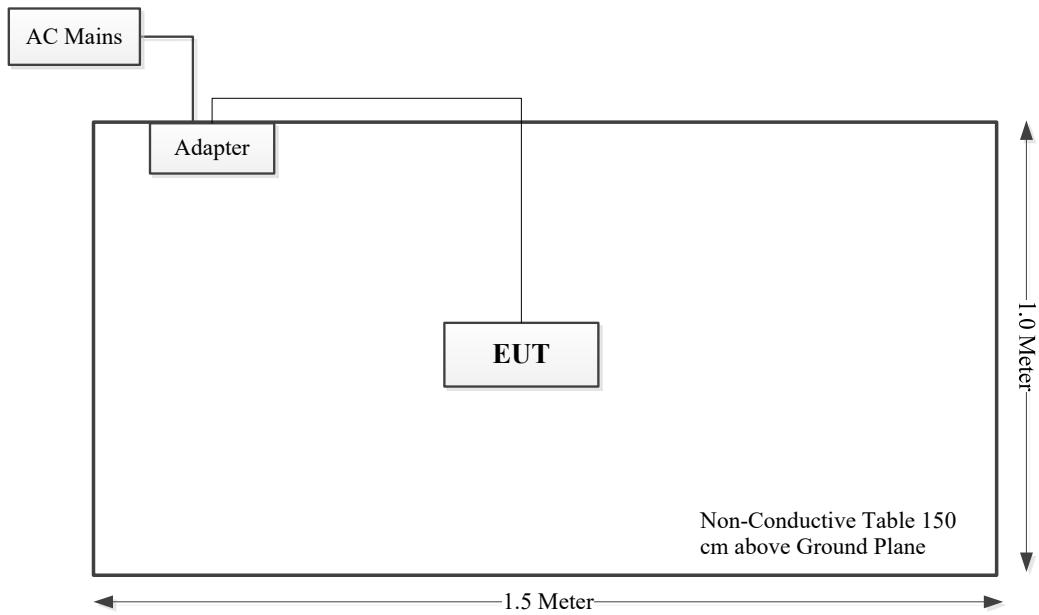
1.2.2 Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
Lumi United Technology Co., Ltd	Adapter	MDY-08-ET	1A422105116267C

1.2.3 Support Cable List and Details

Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
/	/	/	/	/	/

1.2.4 Block Diagram of Test Setup



1.3 Test Methodology

All measurements contained in this report were conducted with ETSI EN 305 550-1 V1.2.1 (2014-10) Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Radio equipment to be used in the 40 GHz to 246 GHz frequency range; Part 1: Technical characteristics and test methods.

1.4 Measurement Uncertainty

Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.

Parameter	Flab	Maximum allow uncertainty
Radio Frequency	$\pm 0.082 \times 10^{-6}$	$\pm 1 \times 10^{-7}$
Radiated RF power (up to 40 GHz)	$\pm 3.62 \text{dB}$	$\pm 6 \text{dB}$
Radiated RF power (above 40 GHz up to 66 GHz)	$\pm 4.35 \text{dB}$	$\pm 8 \text{dB}$
Radiated RF power (above 66 GHz up to 100 GHz)	$\pm 5.68 \text{dB}$	$\pm 10 \text{dB}$
Radiated RF power (above 100 GHz)	$\pm 6.33 \text{dB}$	/
Humidity	$\pm 5\%$	$\pm 5\%$
Temperature	$\pm 1^\circ\text{C}$	$\pm 1^\circ\text{C}$
DC and low frequency voltages	$\pm 0.4\%$	$\pm 3\%$

2. SUMMARY OF TEST RESULTS

SN	Rule and Clause	Description of Test	Test Result
1	EN 305 550-2 Clause 4.2.1.1	Spectral power density	Compliant
2	EN 305 550-2 Clause 4.2.1.2	RF output power	Compliant
3	EN 305 550-2 Clause 4.2.1.3	Permitted range of operating frequencies	Compliant
4	EN 305 550-2 Clause 4.2.1.4	Transmitter emissions in the Out-of-band domain	Compliant
5	EN 305 550-2 Clause 4.2.1.5	Transmitter unwanted emissions in the spurious domain	Compliant
6	EN 305 550-2 Clause 4.2.2	Receiver spurious components	Not Applicable

Note:

Not Applicable: The device was used in combination with permanently co-located transmitters continuously transmitting.

3. REQUIREMENTS AND TEST PROCEDURES

3.1 Spectral Power Density

3.1.1 Applicable Standard

According to ETSI EN 305 550-2 section 4.2.1.1, the spectral power density applies to transmitters operating in the 57 GHz to 66 GHz frequency range.

The spectral power density, as defined in EN 305 550-1, clause 7.1.1, shall not exceed the limits in EN 305 550-1, clause 7.1.2, Table 9.

Definition:

The power spectral density is the mean Equivalent Isotropic Radiated Power (e.i.r.p) spectral density in dBm per MHz during a transmission.

Limit:

The maximum mean power spectral density is applicable to the system as a whole when operated at the highest stated power level. For a smart antenna system and directional antennas, the limit applies to the configuration that results in the highest PSD (e.i.r.p) and shall not exceed the values given in table 9.

Table 9: Mean Power Spectral Density Limit (PSD) (e.i.r.p)

Frequency Bands	Power Spectral Density	Application	Notes
57 GHz to 64 GHz	13 dBm/MHz e.i.r.p.	Non-specific SRD	
61,0 GHz to 61,5 GHz	No limit defined yet	Non-specific SRD	
122 GHz to 122,25 GHz	10 dBm / 250 MHz and -48 dBm/MHz > 30° elevation	Non-specific SRD	Notes 1, 2 and 3
122,25 GHz to 123 GHz	No limit defined	Non-specific SRD	
244 GHz to 246 GHz	No limit defined	Non-specific SRD	
NOTE 1: These limits should be measured with an rms detector and an averaging time of 1 ms or less.			
NOTE 2: The limit of -48 dBm/MHz applies for the normal operation mode of handheld and mobile devices and for fixed installation.			
NOTE 3: See for declaration requirements, clause 5.1.			

3.1.2 Test Procedure

According to ETSI EN 305 550-1 V1.2.1 (2014-10) §7.1.3.

3.2 RF Output Power

3.2.1 Applicable Standard

According to EN 305 550-2 section 4.2.1.2, the RF output power, as defined in EN 305 550-1, clause 7.2.1, shall not exceed the limits in EN 305 550-1, clause 7.2.2, Table 10.

Definition:

The RF output power is the mean Equivalent Isotropic Radiated Power (EIRP) for the equipment during a transmission burst. The mean e.i.r.p. refers to the highest power level of the transmitter power control range during the transmission cycle if the transmitter power control is implemented.

Limit:

The maximum RF output power is applicable to the system as a whole when operated at the highest stated power level. For a smart antenna system and directional antennas, the limit applies to the configuration which results in the highest EIRP.

The maximum RF output power in normal wideband operation shall be limited by usage as indicated in table 10.

Table 10: RF output power limit [i.12]

Frequency Bands	RF output power	Application	Notes
57 GHz to 64 GHz	100 mW e.i.r.p / 20 dBm e.i.r.p.	Non-specific SRD	Note 1
61,0 GHz to 61,5 GHz	100 mW e.i.r.p./ 20 dBm e.i.r.p.	Non-specific SRD	
122 GHz to 123 GHz	100 mW e.i.r.p./ 20 dBm e.i.r.p.	Non-specific SRD	Note 2
244 GHz to 246 GHz	100 mW e.i.r.p./ 20 dBm e.i.r.p.	Non-specific SRD	

NOTE 1: A max transmitter output power of 10 dBm.

NOTE 2: Some countries may permit higher output power according to CEPT/ERC Recommendation 70-03 [i.1].

3.2.2 Test Procedure

According to ETSI EN 305 550-1 V1.2.1 (2014-10) §7.2.3

3.3 Permitted Range Of Operating Frequencies

3.3.1 Applicable Standard

According to EN 305 550-2 section 4.2.1.3, the permitted range of operating frequencies, as defined in EN 305 550-1, clause 7.3.1, shall not exceed the limits in EN 305 550-1, clause 7.3.4.

This requirement applies to all transmitters.

Definition:

The permitted range of operating frequencies is the frequency range over which the equipment is authorized to operate.

This can also be seen as occupied bandwidth (OBW) of the device.

The permitted range of operating frequencies includes all frequencies on which the equipment may operate within an assigned frequency band. If the operating frequency range cannot be measured it shall be declared by the manufacturer.

The lowest operating frequency can be defined as f_L , the highest operating frequency can be defined as f_H . If the device can work in different modes and different frequency ranges these frequencies should be reported for each mode and frequency range.

Limit:

The width of the power spectrum envelope is $f_H - f_L$ for a given operating frequency. In equipment that allows adjustment or selection of different operating frequencies, the power envelope takes up different positions in the allowed band. The frequency range is determined by the lowest value of f_L and the highest value of f_H resulting from the adjustment of the equipment to the lowest and highest operating frequencies.

The occupied bandwidth, the bandwidth in which 99 % of the wanted emission is contained, and the necessary bandwidth of the transmitter shall fall within the assigned frequency band.

For all equipment the frequency range shall lie within the frequency band given in tables 9 and 10. For non-harmonized frequency bands, the available frequency range may differ from tables 9 and 10.

3.3.2 Test Procedure

According to ETSI EN 305 550-1 V1.2.1 (2014-10) §7.2.3

3.4 Out-Of-Band Emissions

3.4.1 Applicable Standard

According to EN 305 550-2 section 4.2.1.4, the Out-of-band emissions in the Out-of-band domain, as defined in EN 305 550-1 [1], clause 7.4.1, shall not exceed the limits in EN 305 550-1 [1], clause 7.4.4, table 13.

This requirement applies to all transmitters.

Definition:

Emission on a frequency or frequencies immediately outside the necessary bandwidth which results from the modulation process, but excluding spurious emissions.

Out-of-band emissions are measured as mean power spectral density (e.i.r.p) under normal operating conditions.

The measurement results of f_H and f_L will be used to determine the occupied BW of the device.

The Occupied Bandwidth ($f_H - f_L$) will be used to calculate the ranges of OOB and spurious domain.

Limit:

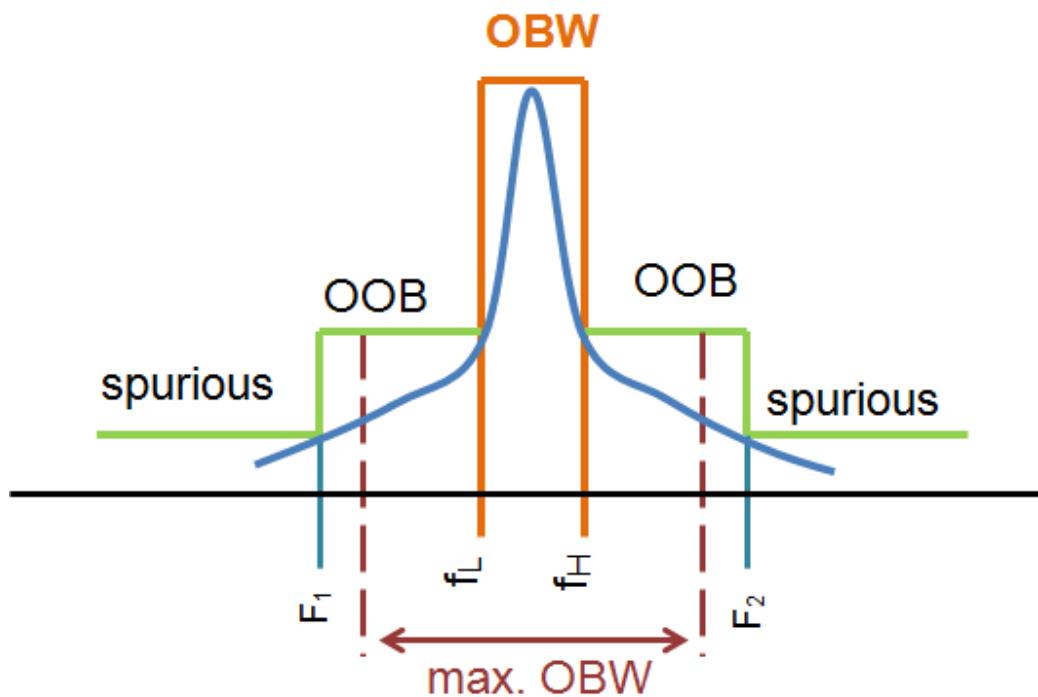
The borders for the OOB and spurious domain are dependent on the Occupied Bandwidth of the EUT.

- The borders are calculated as follows:

$F_1 = \text{centre frequency of OBW [GHz]} - (2,5 * (f_H - f_L))$

$F_2 = \text{centre frequency of OBW [GHz]} + (2,5 * (f_H - f_L))$

This calculation taken into account that the border between OOB and spurious will be larger/ smaller the maximum permitted range of operation (see figure 9).



An additional requirement introduced: if the calculated F1/F2 will be theoretical below or above the frequency which came out of the calculation based on 250 % of the maximum allowed OBW (see tables 9 and 10). Therefore the border between OOB / spurious will be fixed at the frequencies in table 11b (normal 250 % rule based on the Centre frequency of the signal).

Table 11b: Limits for the max. F1 and F2 frequency, based on the max. theoretical OBW of the EUT

Frequency Bands	Centre frequency	Max OBW	F ₁	F ₂
57 GHz to 64 GHz	60,5 GHz	7 GHz	43 GHz	78 GHz
61,0 GHz to 61,5 GHz	61,25 GHz	500 MHz	60 GHz	62,5 GHz
122 GHz to 123 GHz	122,5 GHz	1 GHz	120 GHz	125 GHz
244 GHz to 246 GHz	245 GHz	2 GHz	240 GHz	250 GHz

The rms power density radiated in the calculated OOB domain (between $F_1 \leq f < f_L$ and $f_H < f \leq F_2$) shall not exceed the values shown in tables 12 and 13 [i.4].

Table 12: Out of band domain

Frequency [GHz]	rms power density [dBm/MHz]
$F_1 \leq f < f_L$	See table 13
$f_H < f \leq F_2$	See table 13

Table 13: Limits for out of band radiation

Frequency Bands	OOB limit [dBm/MHz]
57 GHz to 64 GHz	-20 dBm/MHz
61,0 GHz to 61,5 GHz	-10 dBm/MHz
122 GHz to 123 GHz	-10 dBm/MHz
244 GHz to 246 GHz	-15 dBm/MHz

3.4.2 Test Procedure

According to ETSI EN 305 550-1 V1.2.1 (2014-10) §7.4.3

3.5 Unwanted Emissions In The Spurious Domain

3.5.1 Applicable Standard

According to EN 305 550-2 section 4.2.1.5, the unwanted emissions in the spurious domain, as defined in EN 305 550-1, clause 7.5.1, shall not exceed the limits in EN 305 550-1, clause 7.5.4, table 14.

This requirement applies to all transmitters.

Definition:

Emission on a frequency or frequencies which are outside the necessary bandwidth and the level of which may be reduced without affecting the corresponding transmission of information. Spurious emissions include harmonic emissions, parasitic emissions, intermodulation products and frequency conversion products, but exclude out-of-band emissions.

Spurious emissions are measured as spectral power density under normal operating conditions.

According to CEPT/ERC Recommendation 74-01 and Recommendation ITU-R SM.329-12, the boundary between the out-of-band and spurious domains is $\pm 250\%$ of the necessary bandwidth (OBW) from the centre frequency of the emission.

For the considered frequency bands the spurious frequency domains are:

- Frequencies $f < F_1$ [GHz]

and

- frequencies $f > F_2$ [GHz].

The calculations of these Frequencies is shown in clause 7.4.4, the minimum and maximum values are listed in table 11b.

Limit:

The effective radiated power of any radiated spurious emission shall not exceed the values given in table 14.

Table 14: Limits of radiated spurious emissions

Frequency range (MHz)	Limit values for spurious radiation (Measuring receiver bandwidths see table 2)	Detector type
47 to 74	-54 dBm e.r.p.	Quasi-Peak
87,5 to 118	-54 dBm e.r.p.	Quasi-Peak
174 to 230	-54 dBm e.r.p.	Quasi-Peak
470 to 862	-54 dBm e.r.p.	Quasi-Peak
otherwise in band 30 to 1 000	-36 dBm e.r.p.	Quasi-Peak
$f > 1 000$ to 300 000	-30 dBm e.i.r.p.	mean (see note)

NOTE: Parameter for measurement:
 - RBW: 1 MHz
 - VBW: 3 MHz
 - Detector: rms
 - Sweep time: minimum 1 radar cycle, maximum 100 ms.

According to CEPT/ERC Recommendation 74-01, spurious emission is measured up to the 2nd harmonic of the fundamental frequency (in this case, the upper frequency limit up to which measurements are performed is 90 GHz).

The following reference bandwidths shall be used:

- 100 kHz between 30 MHz and 1 GHz;
- 1 MHz above 1 GHz.

3.5.2 Test Procedure

According to ETSI EN 305 550-1 V1.2.1 (2014-10) §7.5.3

3.6 Receiver Spurious Components

3.6.1 Applicable Standard

According to EN 305 550-2 section 4.2.2, the unwanted emissions as defined in EN 305 550-1 [1], clause 8.1.1, shall not exceed the limits in EN 305 550-1 [1], clause 8.1.3.

Definition:

Unwanted radiations from the receiver are components at any frequency, radiated by the equipment and antenna. The level of unwanted radiations shall be measured by their effective radiated power when radiated by the cabinet and the integral or dedicated antenna.

Limit:

The power of any unwanted emission:

- 1) shall not exceed 2 nW (-57 dBm) in the range 30 MHz to 1 GHz;
- 2) shall not exceed 20 nW (-47 dBm in reference measurement bandwidth of 1 MHz) on frequencies above 1 GHz. The upper frequency is to include the second harmonic of the EUT or 300 GHz whichever is lower.

The measured unwanted emissions shall be stated in the test report.

3.6.2 Test Procedure

According to ETSI EN 305 550-1 V1.2.1 (2014-10) §8.1.2

4. TEST DATA AND RESULTS

4.1 Spectral Power Density

Serial Number:	1SR6-1	Test Date:	2022/12/17
Test Site:	966-1	Test Mode:	Transmit
Tester:	coco Tian	Test Result:	Pass

Environmental Conditions:

Temperature: (°C)	22.1	Relative Humidity: (%)	60	ATM Pressure: (kPa)	101.9
-------------------	------	------------------------	----	---------------------	-------

Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	Spectrum Analyzer	E4440A	MY44303354	2022/07/15	2023/07/14
Agilent	Harmonic Mixer	Agilent 11970V	2521A01768	2020/11/08	2023/11/07
Flann Microwave	Horn Antenna	861V/385	738	2020/11/08	2023/11/07
Agilent	Signal Generator	E8247C	MY43321352	2022/04/01	2023/03/31
Agilent	mm-Wave Source Modules	83557A	3942A00697	2022/04/01	2023/03/31
NSI	Standard Gain Horn Antenna	RF-SG15	150018	2020/11/08	2023/11/07

* **Statement of Traceability:** China Certification ICT Co., Ltd (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data:

Mode 1

Frequency Range (GHz)	Polar (H/V)	Receiver Reading (dB μ V)	Substituted Method		Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)			
60-64	H	45.75	-40.88	24.10	-16.78	13.00	29.78
60-64	V	46.96	-39.67	24.10	-15.57	13.00	28.57

Mode 2

Frequency Range (GHz)	Polar (H/V)	Receiver Reading (dB μ V)	Substituted Method		Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)			
60-64	H	44.11	-42.44	24.10	-18.34	13.00	31.34
60-64	V	45.06	-41.49	24.10	-17.39	13.00	30.39

Note 1: The unit of antenna gain is dBd for frequency below 1GHz and is dBi for frequency above 1GHz.

Note 2: Absolute Level = Substituted Level + Antenna Gain

Margin = Limit- Absolute Level

4.2 RF Output Power

Serial Number:	1SR6-1	Test Date:	2022/12/17
Test Site:	966-1	Test Mode:	Transmit
Tester:	coco Tian	Test Result:	Pass

Environmental Conditions:					
Temperature: (°C)	22.1	Relative Humidity: (%)	60	ATM Pressure: (kPa)	101.9

Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	Spectrum Analyzer	E4440A	MY44303354	2022/07/15	2023/07/14
Agilent	Harmonic Mixer	Agilent 11970V	2521A01768	2020/11/08	2023/11/07
Flann Microwave	Horn Antenna	861V/385	738	2020/11/08	2023/11/07
Agilent	Signal Generator	E8247C	MY43321352	2022/04/01	2023/03/31
Agilent	mm-Wave Source Modules	83557A	3942A00697	2022/04/01	2023/03/31
NSI	Standard Gain Horn Antenna	RF-SG15	150018	2020/11/08	2023/11/07

* **Statement of Traceability:** China Certification ICT Co., Ltd (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data:**Mode 1**

Frequency Range (GHz)	Polar (H/V)	Receiver Reading (dB μ V)	Substituted Method		Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)			
60-64	H	73.29	-13.34	24.10	10.76	20.00	9.24
60-64	V	74.28	-12.35	24.10	11.75	20.00	8.25

Mode 2

Frequency Range (GHz)	Polar (H/V)	Receiver Reading (dB μ V)	Substituted Method		Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)			
60-64	H	72.68	-13.87	24.10	10.23	20.00	9.77
60-64	V	73.43	-13.12	24.10	10.98	20.00	9.02

Note 1: The unit of antenna gain is dBd for frequency below 1GHz and is dBi for frequency above 1GHz.

Note 2: Absolute Level = Substituted Level + Antenna Gain

Margin = Limit - Absolute Level

4.3 Permitted Range Of Operating Frequencies

Serial Number:	1SR6-1	Test Date:	2022/12/17
Test Site:	RF	Test Mode:	Transmitting
Tester:	coco Tian	Test Result:	Pass

Environmental Conditions:					
Temperature: (°C)	22.5	Relative Humidity: (%)	58	ATM Pressure: (kPa)	101.9

Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	Spectrum Analyzer	E4440A	MY44303354	2022/07/15	2023/07/14
Agilent	Harmonic Mixer	Agilent 11970V	2521A01768	2020/11/08	2023/11/07
Flann Microwave	Horn Antenna	861V/385	738	2020/11/08	2023/11/07
BACL	TEMP&HUMI Test Chamber	BTH-150-40	30174	2022/04/06	2023/04/05
UNI-T	Multimeter	UT39A+	C210582554	2022/09/29	2023/09/28
ZHAOXIN	DC Power Supply	RXN-6010D	21R6010D0912386	N/A	N/A

* **Statement of Traceability:** China Certification ICT Co., Ltd (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data**Mode 1**

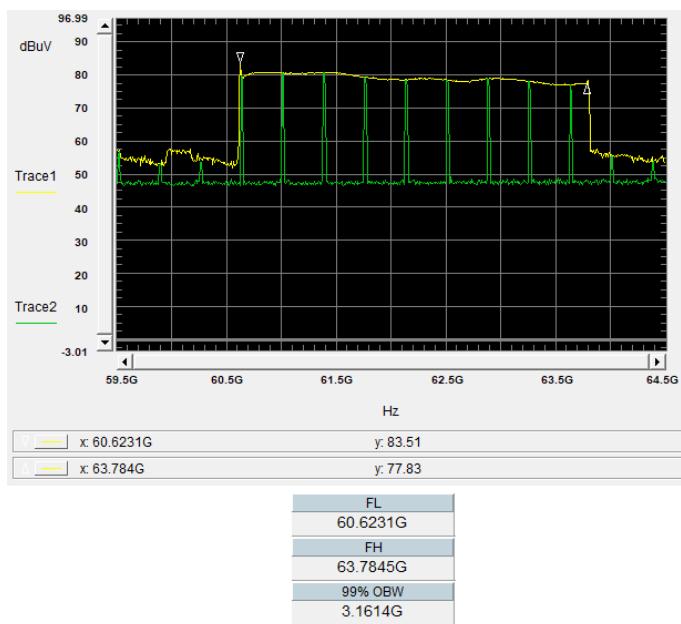
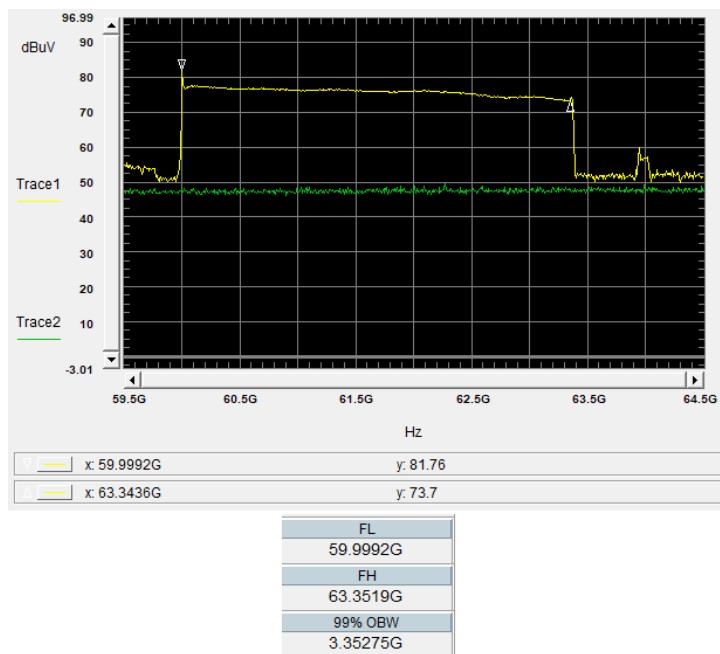
Test Conditions	Frequency (GHz)		f_L Limit (GHz)	f_H Limit (GHz)
	f_L at Low Channel	f_H at High Channel		
NVNT	59.9992	63.3519	57	64
LVLT	60.0008	63.3570	57	64
LVHT	60.0010	63.3562	57	64
HVLT	59.9988	62.3524	57	64
HVHT	59.9980	62.3534	57	64

Mode 2

Test Conditions	Frequency (GHz)		f_L Limit (GHz)	f_H Limit (GHz)
	f_L at Low Channel	f_H at High Channel		
NVNT	60.6231	63.7845	57	64
LVLT	60.6225	63.7860	57	64
LVHT	60.6234	63.7855	57	64
HVLT	60.6275	62.7897	57	64
HVHT	60.6225	62.7853	57	64

Nominal Channel Bandwidth and Occupied Channel bandwidth

Test Mode	Frequency (GHz)	Result (GHz)
Mode 1	61.676	3.353
Mode 2	62.203	3.161



4.4 Out-Of-Band Emissions

Serial Number:	1SR6-1, 1SRA-3	Test Date:	2022/12/17
Test Site:	966-1	Test Mode:	Transmit
Tester:	coco Tian	Test Result:	Pass

Environmental Conditions:					
Temperature: (°C)	22.1	Relative Humidity: (%)	60	ATM Pressure: (kPa)	101.9

Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	Spectrum Analyzer	E4440A	MY44303354	2022/07/15	2023/07/14
Agilent	Harmonic Mixer	Agilent 11970V	2521A01768	2020/11/08	2023/11/07
Flann Microwave	Horn Antenna	861V/385	738	2020/11/08	2023/11/07
Agilent	Signal Generator	E8247C	MY43321352	2022/04/01	2023/03/31
Agilent	mm-Wave Source Modules	83557A	3942A00697	2022/04/01	2023/03/31
NSI	Standard Gain Horn Antenna	RF-SG15	150018	2020/11/08	2023/11/07

* **Statement of Traceability:** China Certification ICT Co., Ltd (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data:

Mode 1

Frequency (GHz)	Polar (H/V)	Receiver Reading (dB μ V)	Substituted Method		Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)			
64.99	H	26.45	-59.66	24.10	-35.56	-20.00	15.56
64.99	V	26.41	-59.70	24.10	-35.60	-20.00	15.60
52.19	H	29.86	-58.25	24.00	-34.25	-20.00	14.25
52.19	V	29.74	-58.37	24.00	-34.37	-20.00	14.37

Mode 2

Frequency (GHz)	Polar (H/V)	Receiver Reading (dB μ V)	Substituted Method		Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)			
64.99	H	26.41	-59.70	24.10	-35.60	-20.00	15.60
64.99	V	26.26	-59.85	24.10	-35.75	-20.00	15.75
52.19	H	29.77	-58.34	24.00	-34.34	-20.00	14.34
52.19	V	29.56	-58.55	24.00	-34.55	-20.00	14.55

Note 1: The unit of antenna gain is dBd for frequency below 1GHz and is dBi for frequency above 1GHz.

Note 2: Absolute Level = Substituted Level + Antenna Gain

Margin = Limit - Absolute Level

4.5 Unwanted Emissions In The Spurious Domain

Serial Number:	1SR6-1	Test Date:	2022/12/16~2022/12/17
Test Site:	966-1, 966-2	Test Mode:	Transmit
Tester:	coco Tian, Carl Xue	Test Result:	Pass

Environmental Conditions:

Temperature: (°C)	22.1~22.4	Relative Humidity: (%)	51~60	ATM Pressure: (kPa)	101.2~101.9
-------------------	-----------	------------------------	-------	---------------------	-------------

Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
ETS-Lindgren	Horn Antenna	3115	9912-5985	2020/10/13	2023/10/12
R&S	Spectrum Analyzer	FSV40	101591	2022/07/15	2023/07/14
MICRO-COAX	Coaxial Cable	UFA210A-1-1200-70U300	217423-008	2022/08/07	2023/08/06
MICRO-COAX	Coaxial Cable	UFA210A-1-2362-300300	235780-001	2022/08/07	2023/08/06
Mini	Pre-amplifier	ZVA-183-S+	5969001149	2022/11/09	2023/11/08
AH	Double Ridge Guide Horn Antenna	SAS-571	1396	2021/10/18	2024/10/17
MICRO-COAX	Coaxial Cable	UFA210B-0-0720-300300	99G1448	2022/07/17	2023/07/16
Agilent	Signal Generator	E8247C	MY43321352	2022/04/01	2023/03/31
PASTERNACK	Horn Antenna	PE9852/2F-20	112002	2021/02/05	2024/02/04
PASTERNACK	Horn Antenna	PE9852/2F-20	112001	2021/02/05	2024/02/04
AH	Preamplifier	PAM-1840VH	190	2022/11/09	2023/11/08
PASTERNACK	Horn Antenna	PE9850/2F-20	072001	2021/02/05	2024/02/04
PASTERNACK	Horn Antenna	PE9850/2F-20	072002	2021/02/05	2024/02/04
MICRO-COAX	Coaxial Cable	UFB142A-1-2362-200200	235772-001	2022/08/07	2023/08/06
OML	Harmonic Mixer	WR19/M19HWD	U60314-1	2020/10/16	2023/10/15
OML	Horn Antenna	M19RH	11648-03	2020/10/16	2023/10/15
OML	Harmonic Mixer	WR12/M12HWD	E60119-1	2020/10/17	2023/10/16
OML	Horn Antenna	M12RH	E60119-2	2020/10/18	2023/10/17
OML	Harmonic Mixer	WR08/M08HWD	F60315-1	2020/10/22	2023/10/21
OML	Horn Antenna	M08RH	F60315-2	2020/10/24	2023/10/23
Flann Micowave	Horn Antenna	24245-AB	28	2020/10/16	2023/10/15
Flann Micowave	Horn Antenna	861W/387	357	2020/10/16	2023/10/15
Agilent	mm-Wave Source Modules	83556A	3138A00549	2022/04/01	2023/03/31
Agilent	mm-Wave Source Modules	83557A	3942A00697	2022/04/01	2023/03/31
Sunol Sciences	Antenna	JB6	A082520-5	2020/10/19	2023/10/18

R&S	EMI Test Receiver	ESR3	102724	2022/07/15	2023/07/14
TIMES MICROWAVE	Coaxial Cable	LMR-600-UltraFlex	C-0470-02	2022/07/17	2023/07/16
TIMES MICROWAVE	Coaxial Cable	LMR-600-UltraFlex	C-0780-01	2022/07/17	2023/07/16
Sonoma	Amplifier	310N	186165	2022/07/17	2023/07/16

* **Statement of Traceability:** China Certification ICT Co., Ltd (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data

30MHz-40GHz

Mode 1

Frequency (MHz)	Polar(H/V)	Receiver Reading (dB μ V)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
3227.40	H	38.79	-58.21	10.29	1.14	-49.06	-30.00	19.06
3227.40	V	37.06	-59.69	10.29	1.14	-50.54	-30.00	20.54
24313.30	H	49.48	-57.73	20.00	1.47	-39.20	-30.00	9.20
24313.30	V	52.39	-54.31	20.00	1.47	-35.78	-30.00	5.78
497.67	H	40.89	-66.02	0.00	0.45	-66.47	-57.00	9.47
43.65	V	39.31	-55.24	-21.58	0.12	-76.94	-57.00	19.94

Mode 2

Frequency (MHz)	Polar (H/V)	Receiver Reading (dB μ V)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
3227.40	H	38.57	-58.43	10.29	1.14	-49.28	-30.00	19.28
3227.40	V	37.24	-59.51	10.29	1.14	-50.36	-30.00	20.36
24313.30	H	49.23	-57.98	20.00	1.47	-39.45	-30.00	9.45
24313.30	V	52.44	-54.26	20.00	1.47	-35.73	-30.00	5.73
501.17	H	40.24	-66.60	0.00	0.45	-67.05	-57.00	10.05
43.81	V	39.89	-54.87	-21.37	0.12	-76.36	-57.00	19.36

Note 1: The unit of antenna gain is dBd for frequency below 1GHz and is dBi for frequency above 1GHz.

Note 2: Absolute Level = Substituted Level - Cable loss + Antenna Gain

Margin = Limit- Absolute Level

Above 40GHz:**Mode 1**

Frequency (GHz)	Polar (H/V)	Receiver Reading (dB μ V)	Substituted Method		Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dB i)			
48.55	H	31.42	-57.26	24.00	-33.26	-30.00	3.26
48.55	V	31.44	-57.24	24.00	-33.24	-30.00	3.24
74.35	H	26.59	-58.06	24.10	-33.96	-30.00	3.96
74.35	V	26.61	-58.04	24.10	-33.94	-30.00	3.94

Mode 2

Frequency (GHz)	Polar (H/V)	Receiver Reading (dB μ V)	Substituted Method		Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dB i)			
48.55	H	31.53	-57.15	24.00	-33.15	-30.00	3.15
48.55	V	31.57	-57.11	24.00	-33.11	-30.00	3.11
74.35	H	24.55	-60.10	24.10	-36.00	-30.00	6.00
74.35	V	26.55	-58.10	24.10	-34.00	-30.00	4.00

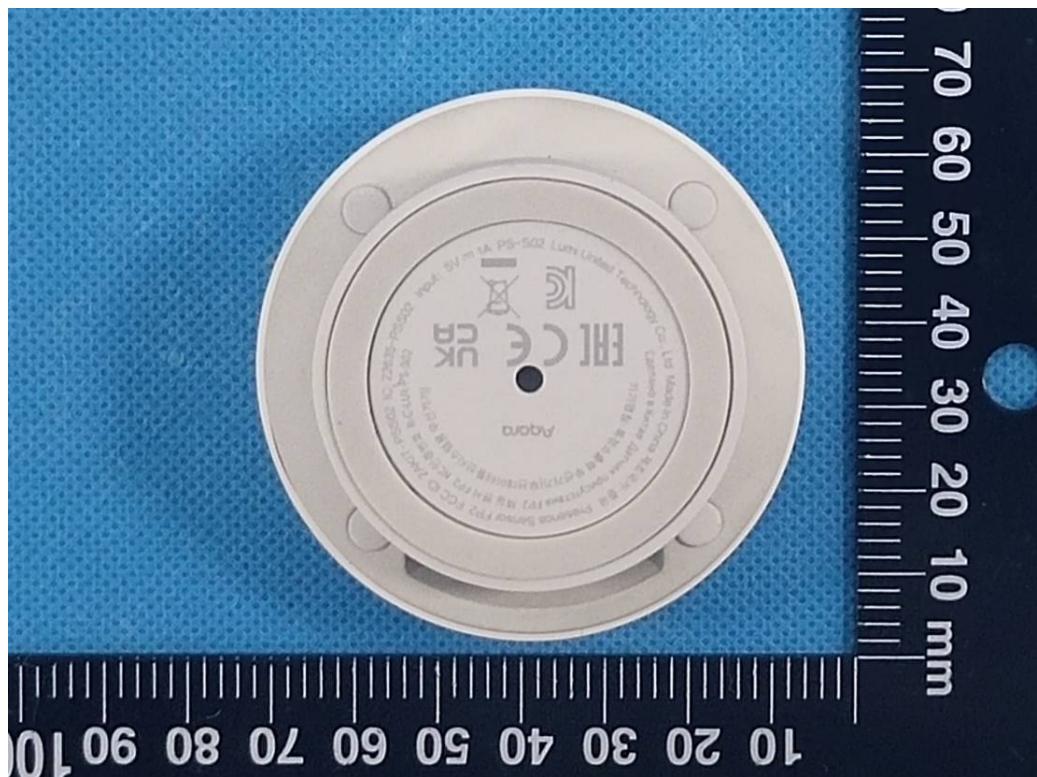
Note 1: The unit of antenna gain is dBd for frequency below 1GHz and is dBi for frequency above 1GHz.

Note 2: Absolute Level = Substituted Level + Antenna Gain

Margin = Limit - Absolute Level

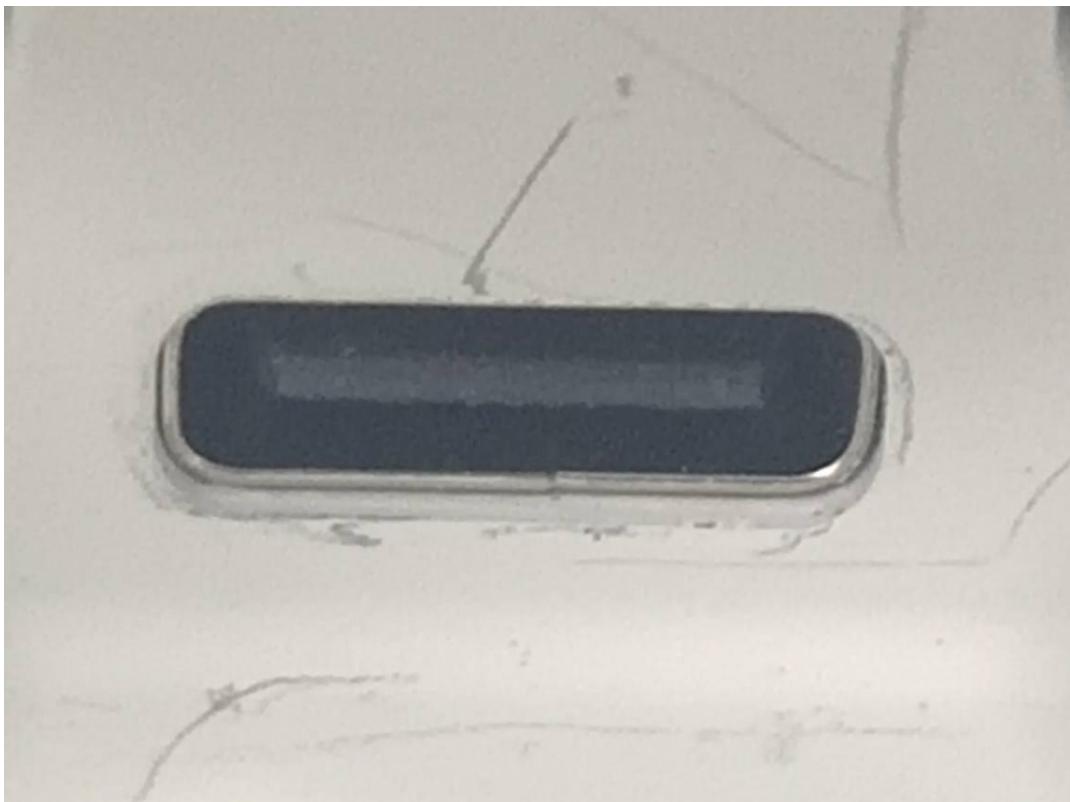
5. EUT PHOTOGRAPHS



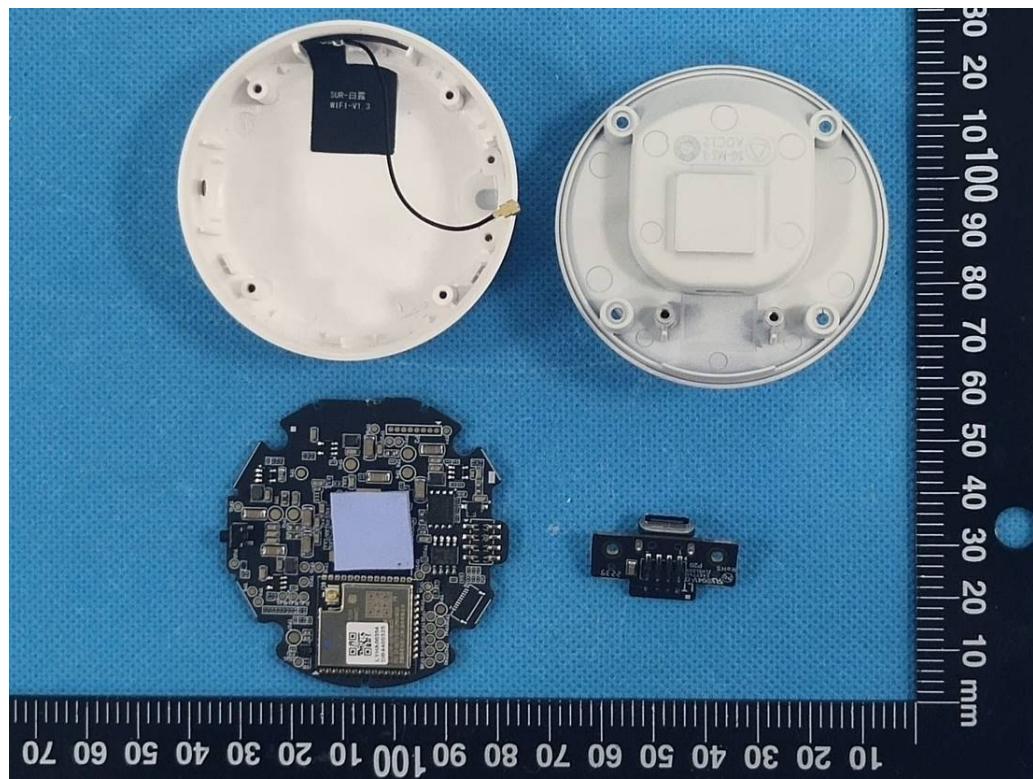
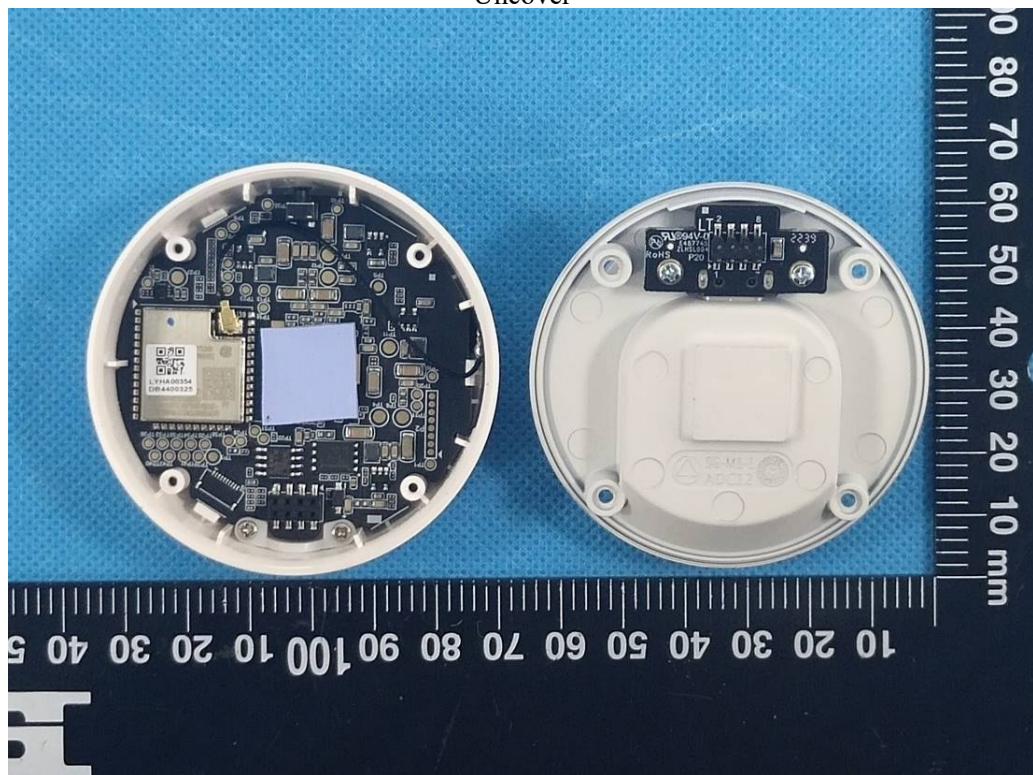








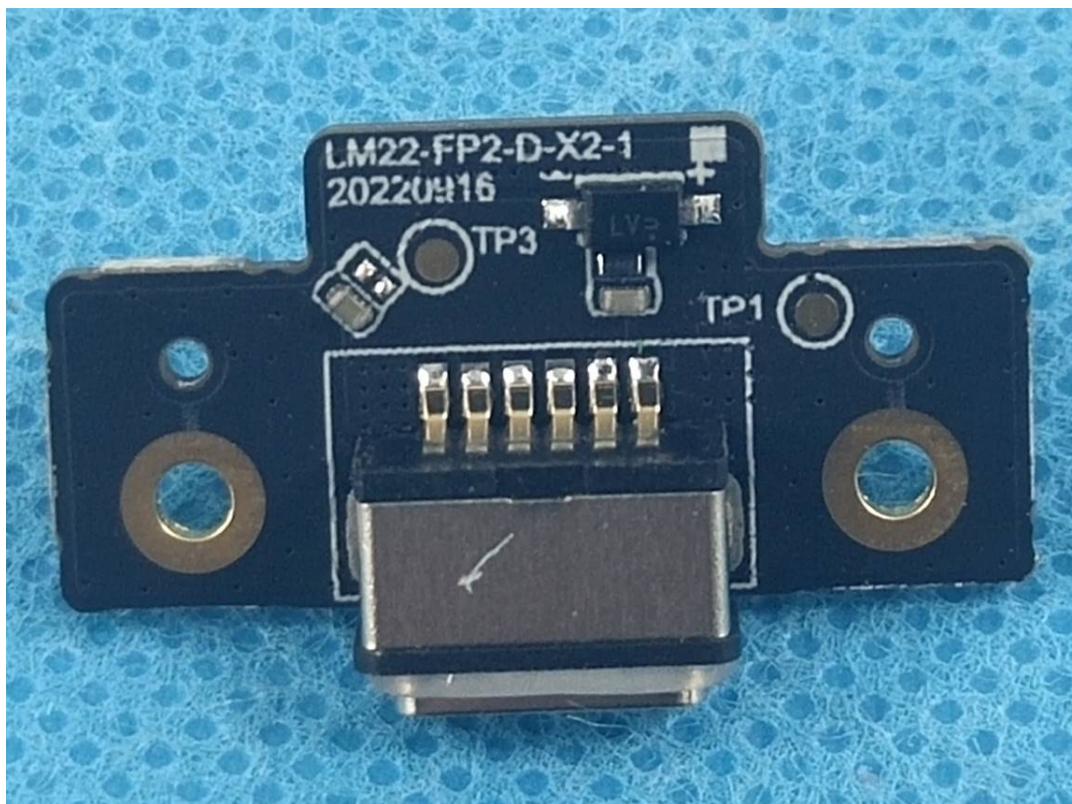
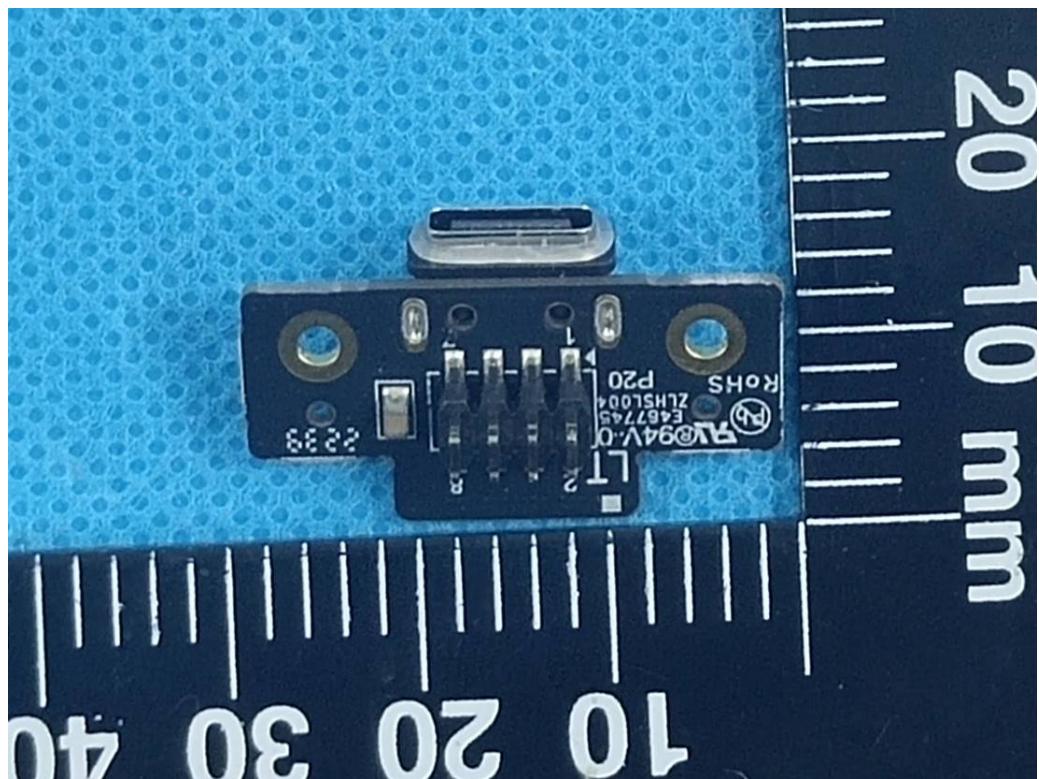
Uncover



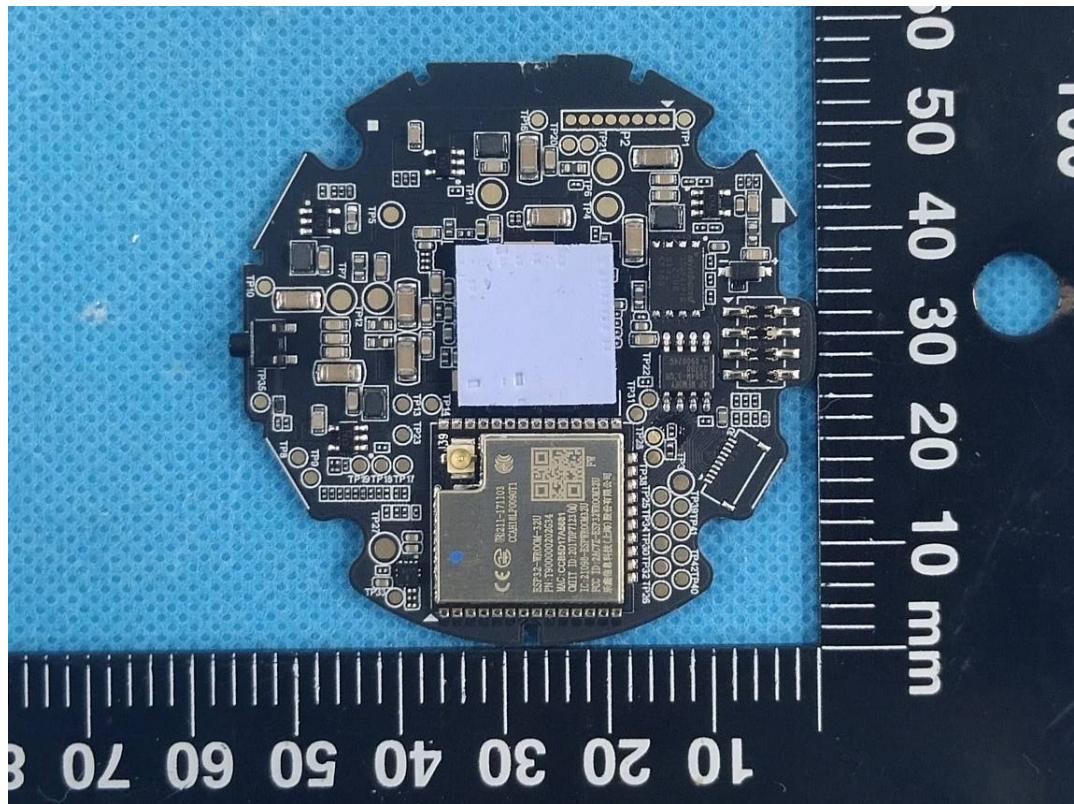
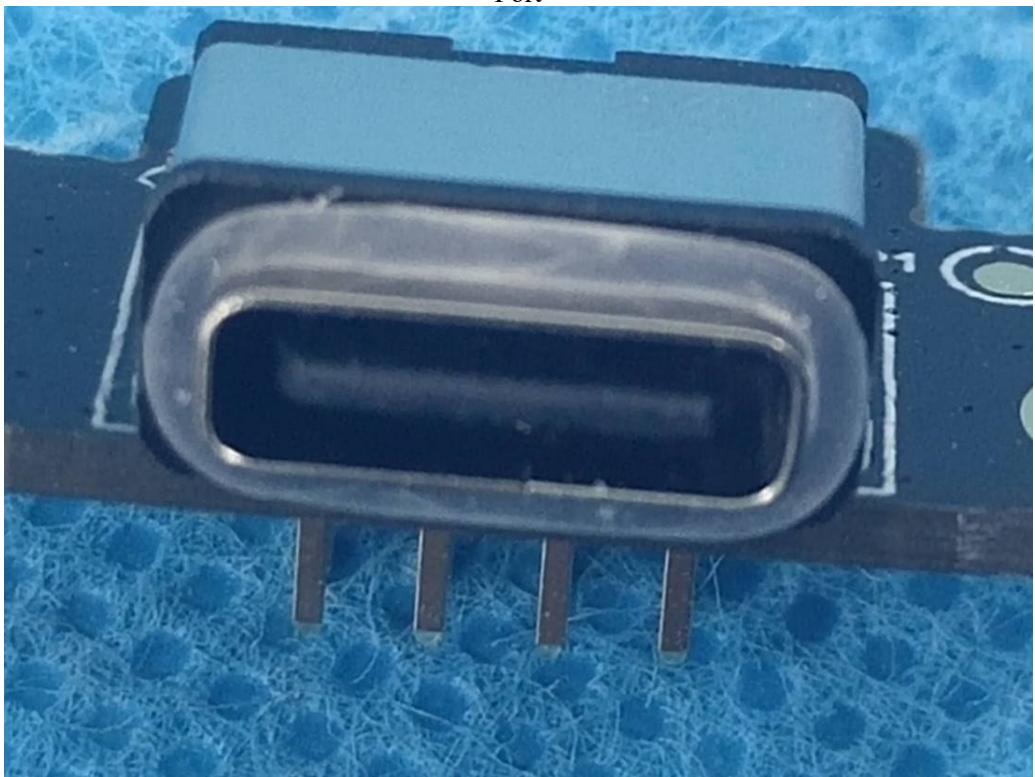


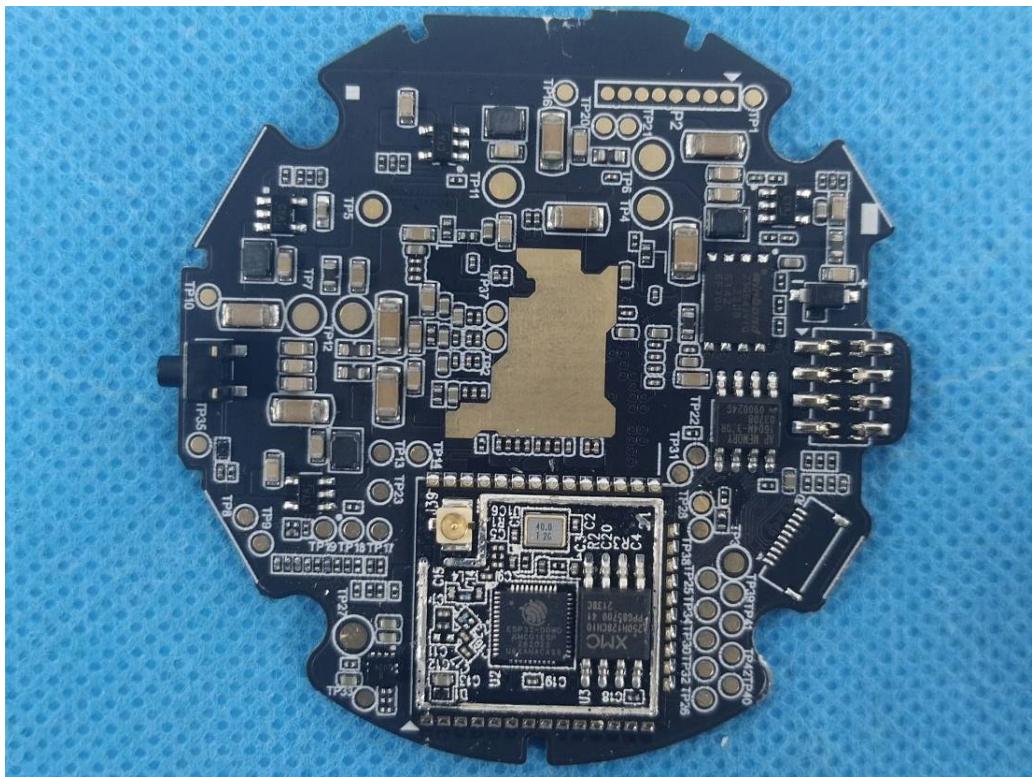
WiFi Antenna



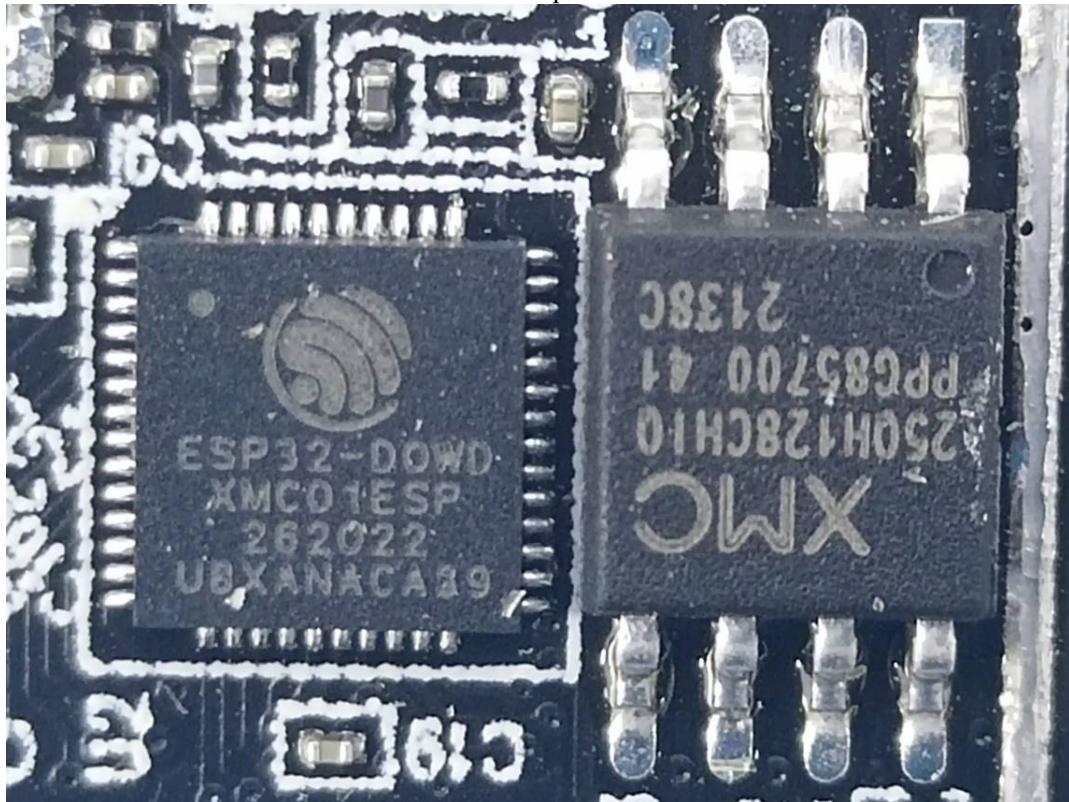


Port

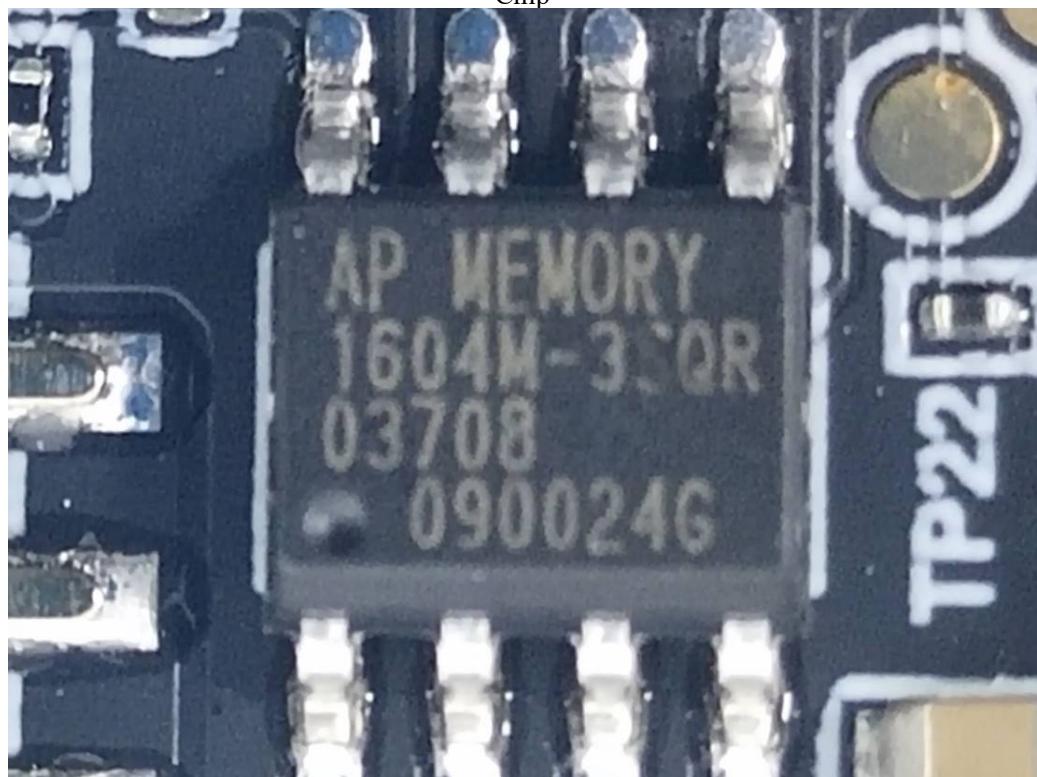




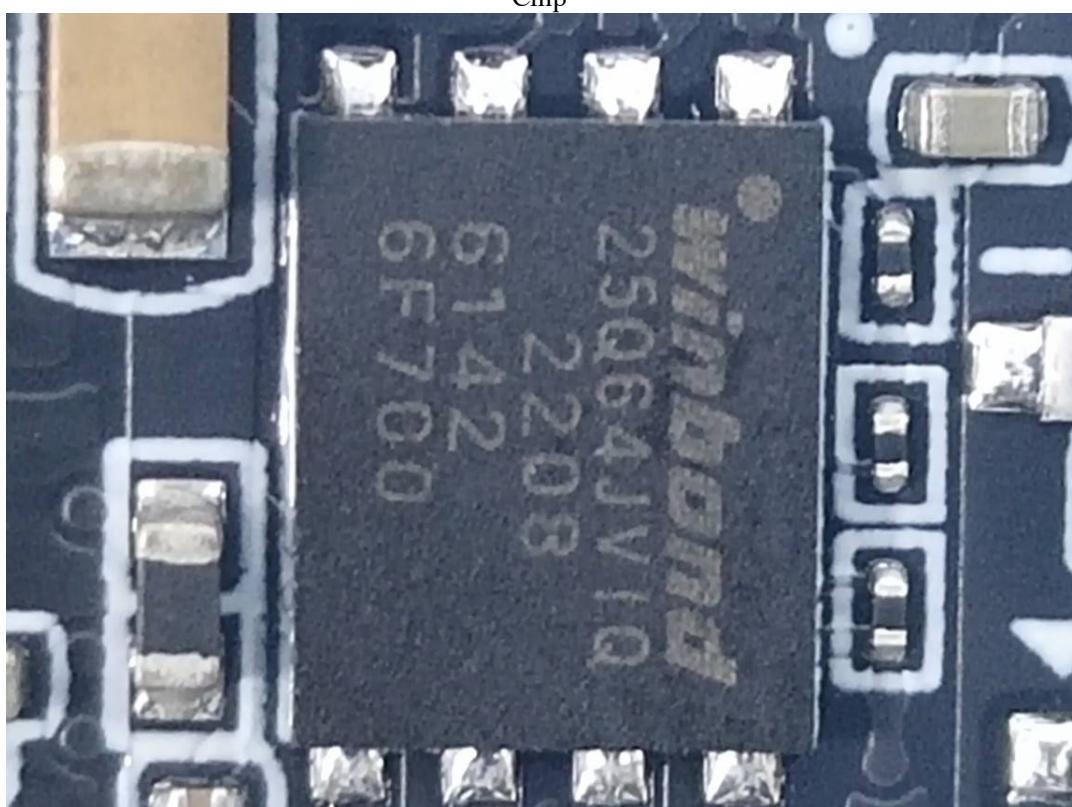
Chip

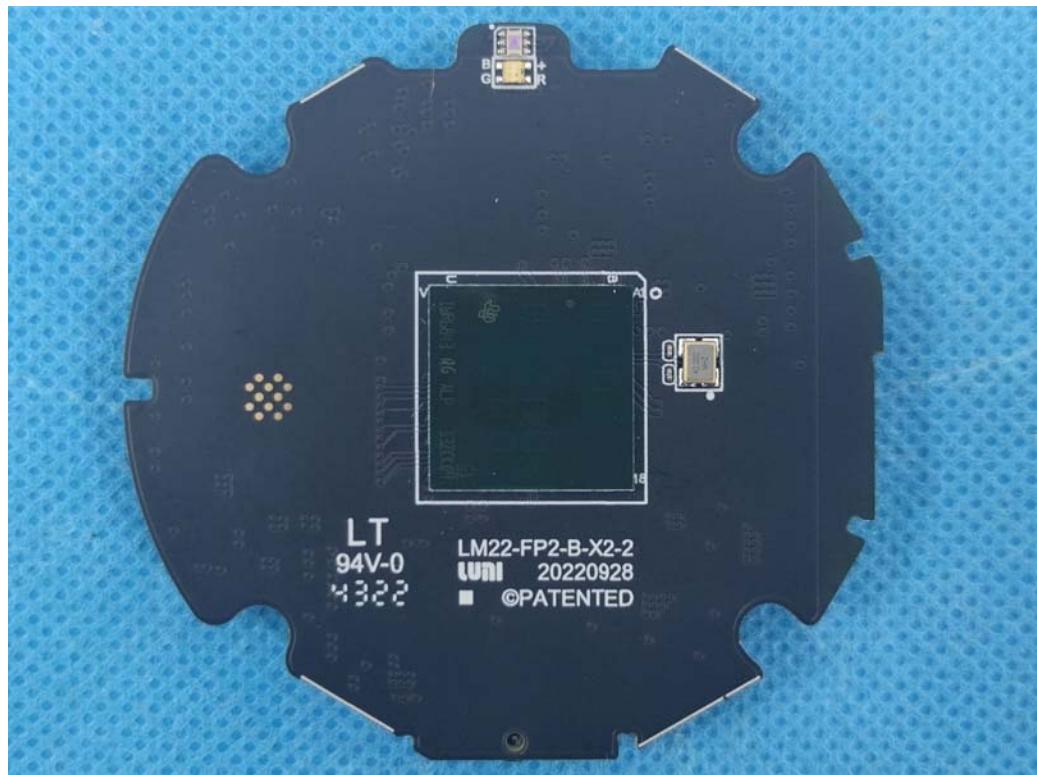


Chip

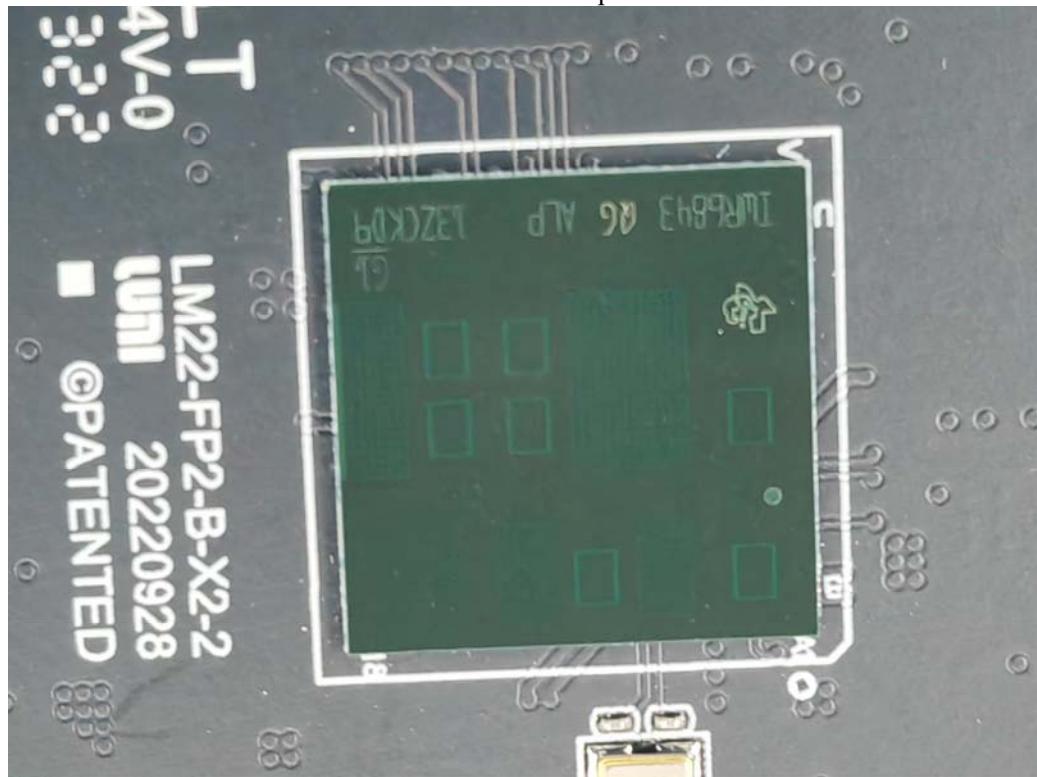


Chip



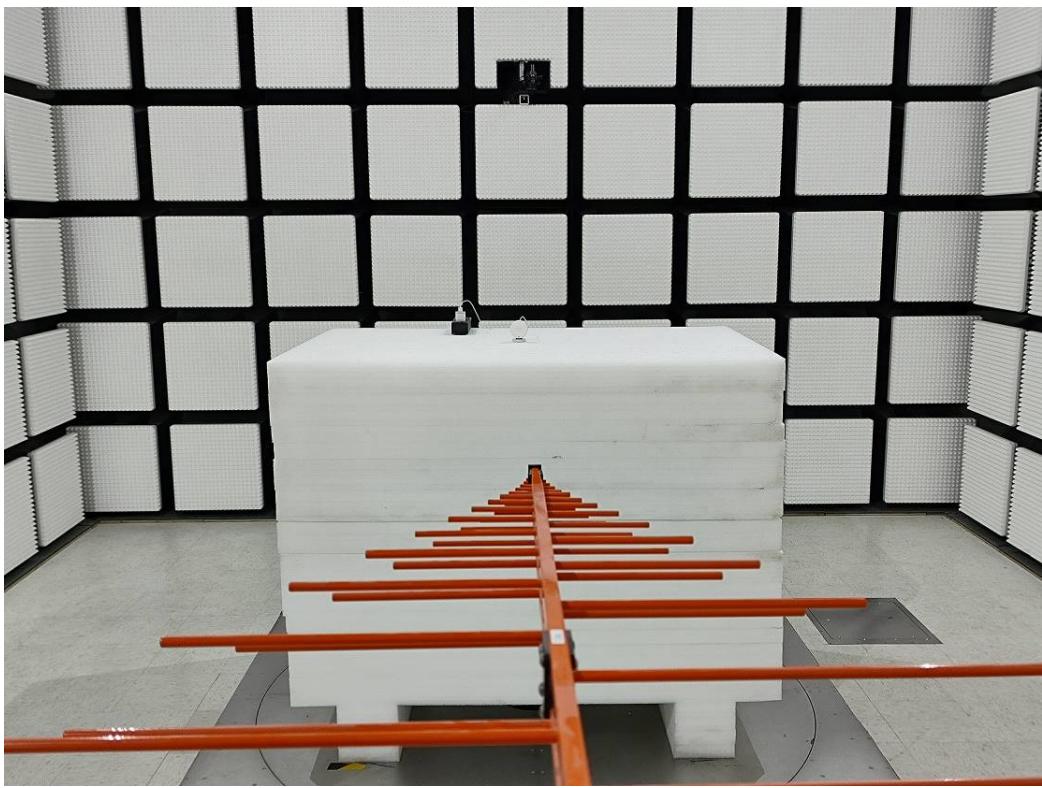


60G Radar chip

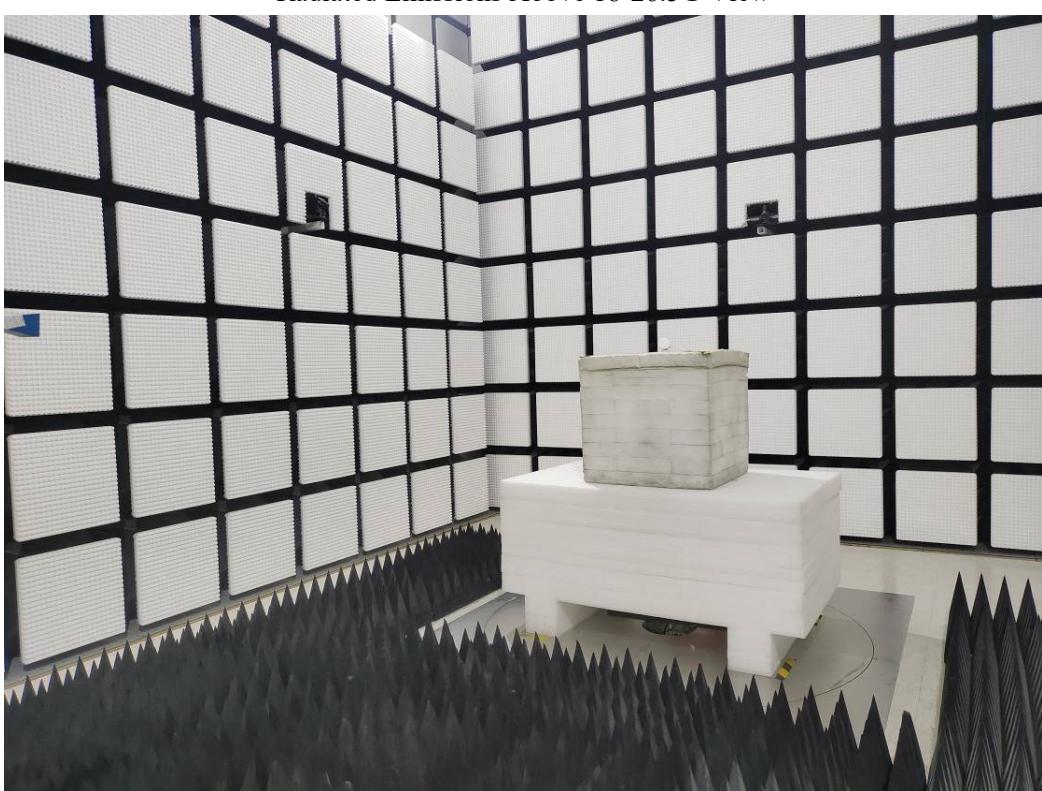


6. TEST SETUP PHOTOGRAPHS

Radiated Emissions Below 1GHz View



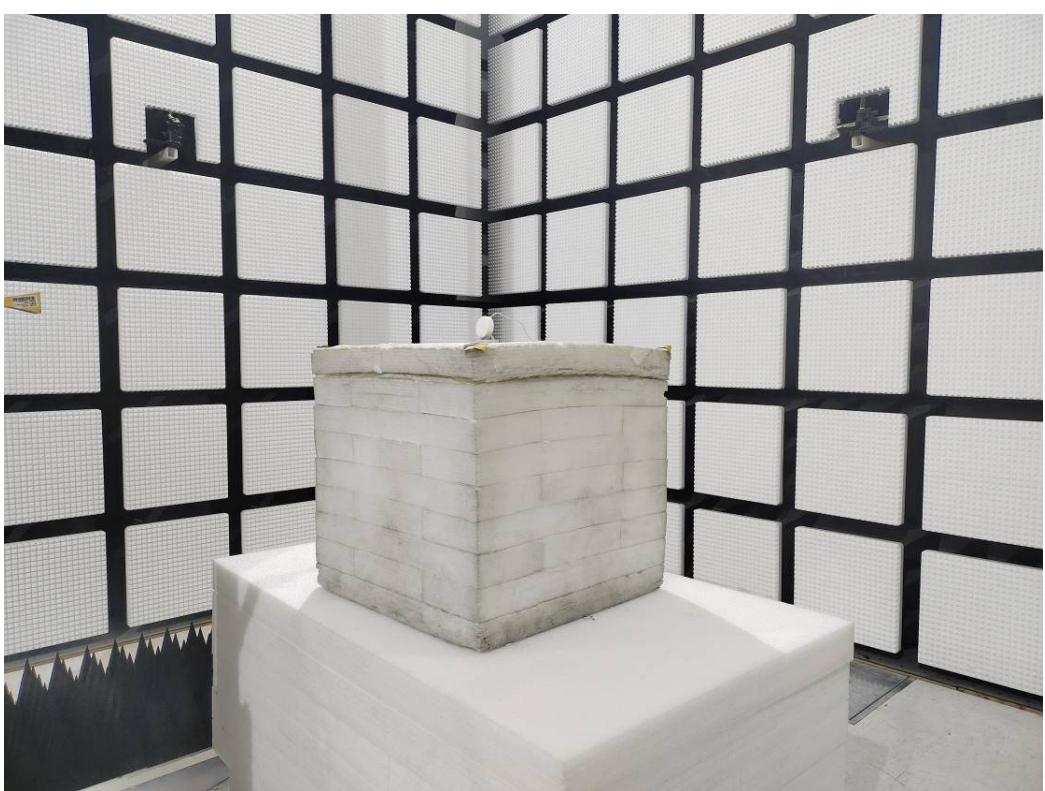
Radiated Emissions Above 18-26.5G View



Radiated Emissions Above 26.5-40G View



Radiated Emissions Above 40-60G View



Radiated Emissions Above 60-90G View



Radiated Emissions Above 90-128G View



===== END OF REPORT =====